FANOX

TEMPERATURE CONTROLLER FANOX TP 731

Packaging content:
- PID Controller.
- Back cover.
- Brackets.
- Rubber outline.
- User manual.

Thank you for purchasing this product. We suggest to read the user manual carefully before using the equipment with the purpose of getting used to its configuration and operating. Keep the manual for any after-query.

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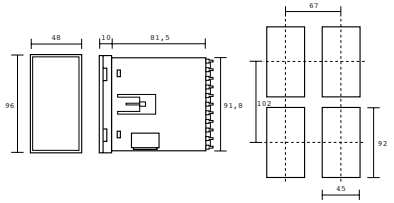
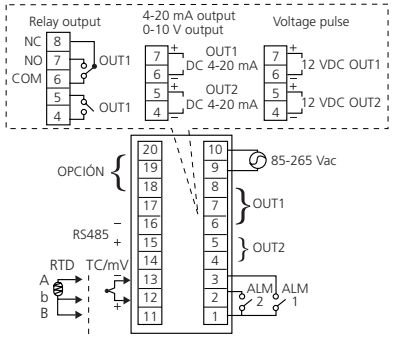
DIMENSIONS / CUTOUT

Unit: mm



WARNING

- Make sure to tight correctly the connection terminals. If this is not done correctly mechanical failures or even fire may occur.
- Please, do not install this equipment in locations where inflammable gases can exist, due to the possibility of explosion.
- The life-time of the equipment depends on the way of use. If that life-time is exceeded, the probability of deterioration of the equipment increases.
- Do not dismantle, review or repair the equipment by your own without authorization. This can cause short circuits on electrical parts, failures or fire.
- Do not introduce metallic elements between the chips of the interior of the equipment or short circuits and fire could be produced.



CAUTION

Please read the following warnings carefully, which will allow you to use correctly the equipment:

- Use the equipment within the specified limits for its water immersion and exposure to oil.
- Do not use the equipment in locations exposed to vibrations or thumps. The use of the equipment in these locations can cause damages due to stress.
- Do not use the equipment in locations exposed to dust, corrosive gases or direct sun.
- Separate the input signal from the entrance, the cables of input signal and the equipment from noise sources or high voltage cables that generate noises.
- Separate the equipment from static electricity sources when the equipment is used in areas where a lot of static electricity is generated (e. g. manufacture of compounds, dusts or transport of fluid material by pipes).
- The organic solutions as well as basic or acid solutions could damage the case of the temperature controller.
- Store it to the specified temperature. If the temperature controller has been stored under – 10 ºC, keep the equipment to room temperature during a minimum of 3 hours before using it.

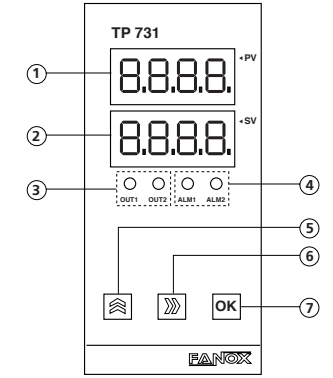
Please, verify the supply characteristics of the equipment. Do not connect the terminals that are not going to be used.

We propose the use of AWG 18 – 24 cables for the signal line and AWG 25 – 30 cable for the supply and exit contact relay.

SPECIFICATIONS

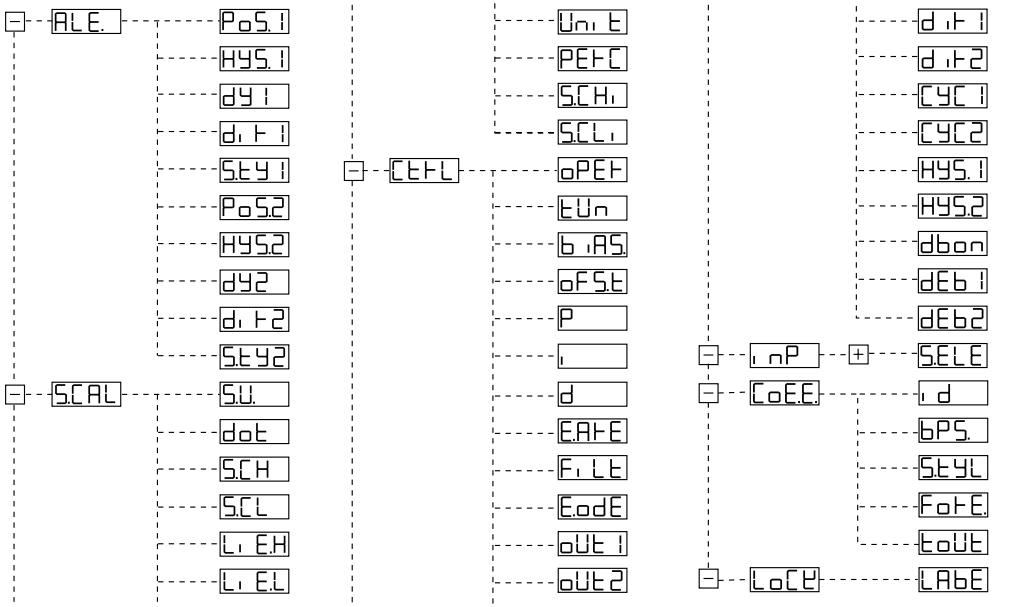
Supply:	85~265 Vac, 50/60 Hz
Display:	Upper display (red): 4 digits 0,56" 7 segments Lower display (green): 4 digits 0,36" 7 segments
Input signal:	Thermocouple: J, K, B, N, R, S, T, E RTD: PT100, JPT100 Voltage DC: 0~350 mV
Output control:	Output relay (resistive) SPDT, 5A/250 Vac Output pulse voltage (SSR) NPN, 20 mA at 12 Vdc Analog output (max. 600_): 4~20 mA, 0~10 Vdc
Alarm relay:	SPST-NO, 3A/250 Vac (resis.)
Dwell time:	00~99 s
Hysteresis:	0~999,9 ºC (ºF)
Communications:	Output RS485
Operating conditions:	0~50 ºC (20~85 % HR)
Output control cycle:	0~999,9 s
Decimal point:	0~3 digits
Digital filter:	1~100
Control method:	ON/OFF or PID (Autotuning)
Offset input:	-199,9~999,9
Fraction value:	0000~9999
Setting range:	-1999~9999
Accuracy:	± 0,3 % ± 1 digit
Sampling time:	200 ms
Memory:	EEPROM

FRONTAL PANEL



1. Process value and function visualization: Red LED of 7 segments.
2. Setting value and parameters visualization: Green LED of 7 segments.
3. Indication of the output control.
4. Indication of alarms.
5. key : Advance to an inferior level and position.
6. key : Back up to a superior level and add.
7. OK key : Move in a level and confirm.

PROGRAM SETTING FLOWCHART



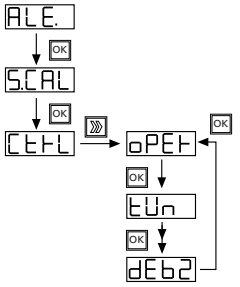
BUTTONS EXPLANATION

The settings of the equipment are controlled by means of 3 push-buttons located in the front. First you must decide to which function you want to enter and then use the push-buttons to reach it. The push-buttons are used in the following way:

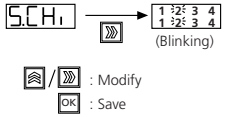
	Selection	Settings
FORWARD	Advance to inferior level	Position
BACKWARD	Back up to a superior level	Add
OK	Move in a level	Confirm

BUTTON "OK"

1) Allows to move in a menu.

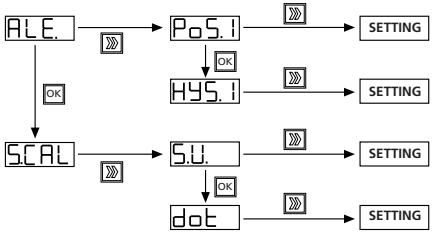


2) Confirm to save the settings.



BUTTON "FORWARD"

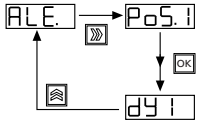
Allows to advance from a superior level to an inferior level.



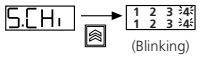
It is also used to move between the positions of the digits of a value to change.

BUTTON "BACKWARD"

Allows to back up from a inferior level to a superior one:



It is also used to increase in a unit the selected digit.



FUNCTION LIST

Ítem	Subitem	Range	Default	Description
ALE.	Po5.1	-1999~9999	0	Alarm relay position 1
	HY5.1	0000~9999	0	Alarm relay hysteresis 1
	dY 1	00~99	00 s	Alarm relay delay 1
	di r1	Hi/Lo	Hi	Alarm relay direction 1
	St.Y1	St 1-St8	St1	Alarm relay style 1
		St9		Alarm follow the action of Out 1
		St 10		Alarm follow the action of Out 2
	Po5.2	-1999~9999	0	Alarm relay position 2
	HY5.2	0000~9999	0	Alarm relay hysteresis 2
	dY2	00~99	00 s	Alarm relay delay 2
	di r2	Hi/Lo	Hi	Alarm relay direction 2
	St.Y2	St 1-St8	St1	Alarm relay style 2
		St9		Alarm follow the action of Out 1
		St 10		Alarm follow the action of Out 2
SCAL	SU	-1999~9999	0	Set value SV
	dot	dot0-dot3	dot 1	Decimal point set
	SCH	-1999~9999	9999	Scale upper limit value
	SCL	-1999~9999	0	Scale lower limit value
	Li.EH	-1998~9999	9999	Maximum range value SV
	Li.EL	-1999~9998	-1999	Minimum range value SV
	Uni.t	oC/oF	ºC	Unit
	PErC	on/oFF	OFF	Percentage
	SCHi	000,0~100,0	100	Scale input upper limit value
	SCLi	000,0~100,0	0	Scale input lower limit value
CtrL	oPEr	Pi d/onoF	ON/OFF	Operation
	tUo	tUn/oFF	OFF	Autotuning
	bi AS	-1999~9999	0	Input setting PV
	oFSt	-1999~9999	0	SV offset value during autotuning
	P	0000~9999	3	P value
	I	0000~9999	200	I value
	d	0000~9999	20	D value
	E.rFE	0000~9999	0	Manual reset
	Fi Lt	1~100	1	Input digital filter
	Eodt	H-C	H-C	Hold temperature over room temperature
		Cool		Hold temperature below room temperature
	oUt1	HEAt	HEAt	Heater is controlled by Out 1
		Cool		Cooler is controlled by Out 1
	oUt2	HEAt	Cool	Heater is controlled by Out 2
		Cool		Cooler is controlled by Out 2

Ítem	Subitem	Range	Default	Description
CtrL	di r1	Hi/Lo	Hi	Control output direct / reverse operation 1
	di r2	Hi/Lo	Hi	Control output direct / reverse operation 2
	CYC1	0000~9999	5 s	Cycle time 1 (seconds)
	CYC2	0000~9999	5 s	Cycle time 2 (seconds)
	HY5.1	0000~9999	0000	Control output hysteresis 1
	HY5.2	0000~9999	0000	Control output hysteresis 2
	dbon	on/oFF	OFF	Deadband control
	dEb1	-1999~9999	0	Deadband parameter of heater
	dEb2	-1999~9999	0	Deadband parameter of cooler
inP	SELE	t tP	t tP	Thermocouple type K (-200~1370 ºC)
		J tP		Thermocouple type J (-210~1200 ºC)
		t tP		Thermocouple type T (-200~400 ºC)
		E tP		Thermocouple type E (-200~1000 ºC)
		r tP		Thermocouple type R (-50~1760 ºC)
		S tP		Thermocouple type S (-50~1760 ºC)
		b tP		Thermocouple type B (250~1820 ºC)
		n tP		Thermocouple type N (-200~1300 ºC)
		Pt.P		Pt100 (-200~850 ºC)
		JPtP		JPT100 (-200~850 ºC)
		dCtP		DC Type (0~350 mV)
CoEE.	id	0000~0255	0001	Device ID number
	bPS	600	9600	BaudRate : 600
		1200		BaudRate : 1200
		2400		BaudRate : 2400
		4800		BaudRate : 4800
		9600		BaudRate : 9600
		192-		BaudRate : 19200
		384-		BaudRate : 38400
	St.YL	8n1	8n1	8 byte size; no parity; 1 stop bit
		8n2		8 byte size; no parity; 2 stop bit
		8o1		8 byte size; odd parity; 1 stop bit
		8E1		8 byte size; even parity; 1 stop bit
	ForE.	HEX.	HEX.	Hex
		ASC.		Ascii
	toUt	0100~9999	0100	Time Out / ms
LoCt	LAbE	Lb00	Lb00	Lock label 0
		Lb01		Lock label 1
		Lb02		Lock label 2
		Lb03		Lock label 3

DESCRIPTION OF PARAMETERS

HYS. Control output hysteresis
A hysteresis can be adjusted around the set point to prevent chattering.

E.rFE Manual reset
In PID control, I=0, PV=SV, reset the control output to the fixed value in this section.

Fi Lt PV input filter
This function should be used when the value of PV fluctuates widely, due to noises in the input signal. If a longer constant time is fixed, the filter eliminate more noises.

CYCL Control output cycle time
The cycle time is the period of ON/OFF repetitions of a relay or voltage pulse output in the proportional PID control. The ratio of the ON time to the cycle time is proportional to the control output value.

di r Direction of relay.

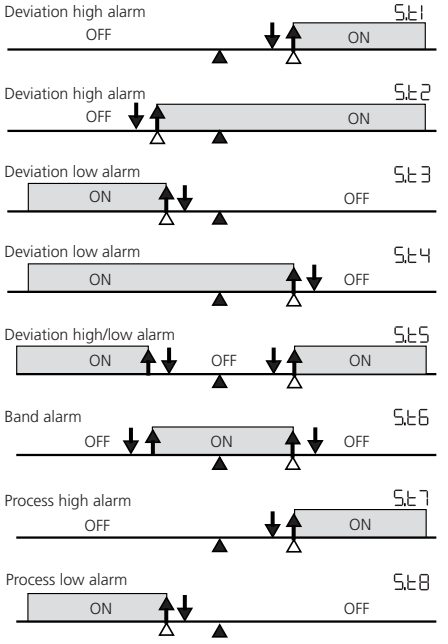
LoCt Function list lock
You can set the mode of function lists which can be displayed and edited.

TROUBLESHOOTING

1	Display over scale
-1	Display under scale
0000	PV over scale
UUUU	PV under scale
----	Sensor break

ALARM MODE SETTING

▲: SV △: Alarm setting value ▼: Hysteresis setting value



FUNCTION LOCK

LOCK	Lb03	Lb02	Lb01	Lb00
ALE.				
Po5.1			0	0
HY5.1				0
dY 1				0
di r1				0
St.Y1				0
Po5.2			0	0
HY5.2				0
dY2				0
di r2				0
St.Y2				0
SCAL				
SU		0	0	0
dot				0
SCH				0
SCL				0
Li.EH				0
Li.EL				0
Uni.t				0
PErC				0
SCHi				0
SCLi				0
CtrL				
oPEr			0	0

LOCK	Lb03	Lb02	Lb01	Lb00
tUn			0	0
bi AS.			0	0
oFS.t			0	0
P			0	0
I			0	0
d			0	0
E.rFE			0	0
Fi Lt			0	0
Eodt			0	0
oUt1			0	0
oUt2			0	0
di r1			0	0
di r2			0	0
CYC1			0	0
CYC2			0	0
HY5.1			0	0
HY5.2			0	0
dbon			0	0
dEb1			0	0
dEb2			0	0
inP				
t tP				0
J tP				0
t tP				0

LOCK	Lb03	Lb02	Lb01	Lb00
E tP				0
r tP				0
S tP				0
b tP				0
n tP				0
Pt.P				0
JPtP				0
dCtP				0
CoEE.				0
id				0
bPS				0
St.YL				0
ForE.				0
toUt				0
LoCt				0
LAbE	0	0	0	0

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HYSTERESIS

	Cal.	Enf.
SV+dEb2	X	0
SV	X	X
SV+dEb1	X	X
	0	X

dEb1<0 ; dEb2>0

	Cal.	Enf.
SV+dEb2	X	0
SV	0	0
SV+dEb1	0	0
	0	X

dEb1>0 ; dEb2<0

X: (Disable): Inhibit output.
O: (Enable): Enable control output to follow PID / ON-OFF control algorithm